Original Report

Screening for At-Risk Alcohol and Drug Use in the Antenatal Period: How Do Young Women Compare with Older Adult Women?

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A B S T R A C T

Study Objective: In the present study we compared results of standardized screening tools for problem alcohol and other drug use in younger (ages 18-24 years) and older (ages 25 and older) women attending the same clinic. We separately investigated pregnant and nonpregnant women.
Design, Setting, Participants, Interventions, and Main Outcome Measures: This was a cross-sectional study of women attending an urban, university-affiliated obstetrics and gynecology clinic. Women were recruited while awaiting appointments with their providers. In total, 3317 provided consent and completed a brief anonymous survey with standardized questions about alcohol and other drug problems. Measures included the T-ACE (acronym for Tolerance, Annoyed when others express concern, Cut down on drinking, Eye-opener) for alcohol and CAGE for other drugs (CAGE is a mnemonic for the following items: (1) Have you ever felt you should cut down on your use of other drugs? (2) Have people annoyed you by criticizing your use of other drugs? (3) Have you ever felt bad or guilty about your use of other drugs? and (4) Have you ever used drugs first thing in the morning to steady your nerves, avoid withdrawal, or get rid of a hangover [eye opener]?). Individual item responses and screener summary scores were compared separately for pregnant and nonpregnant younger (ages 18-24 years) and older adult (25 years of age or older) women using χ^2 for categorical and t tests for continuous variables.
Results: For pregnant women, 386/1460 (26%) of older women screened at-risk for problem drinking compared to 250/1203 (21%) of younger women ($P = .001$). For other drugs, however, 192/1203 (16%) of younger pregnant women screened at risk compared to 186/1461 (13%) of older adult pregnant women ($P = .02$). For nonpregnant women, screen positive rates for at-risk drug use were nearly 2 times higher among older compared with younger women, with 48/321 (15%) of older women screening at risk compared to 28/332 (8%) of younger women ($P < .01$).
Conclusion: The present findings affirm the need for routine screening for alcohol and drug problems in women of all ages, regardless of pregnancy status.
Key Words: Screening, Women's health, Pregnant, Alcohol, Drug use

Introduction

Substance use is a common issue in women's health, and practitioners are faced with the ongoing challenge of identifying those at risk. When such use goes undetected in pregnant and postpartum women, it is associated with increased maternal and fetal/infant morbidity and mortality.[1] Thus, women of childbearing age are of particular concern, because identification of alcohol and drug problems is essential for prevention and treatment. According to the National Survey on Drug Use and Health, 28.6% of women aged 15-44 years report past month binge alcohol use and 13.2% report illicit drug use in the past month.[2] Among pregnant women, 4.3% report past month binge drinking and 6.3% report past month illicit drug use. Routine screening is essential to identify at-risk and problem substance use, provide primary prevention education, and enable practitioners to provide brief intervention or treatment referral when indicated.[3] This is of particular concern because the United States is currently experiencing an opioid epidemic, with a fivefold increase in neonatal abstinence syndrome from 2000 to 2012.[4]

Research on sex- and gender-specific screening instruments has focused largely on pregnant women. Pregnancy has been identified as a critical time to screen, because substance use is particularly stigmatized in this population, and pregnant women have been shown to under-report their substance use.[5,6] Current guidelines from the American College of Obstetricians and Gynecologists recommend screening adult women for at-risk alcohol and drug abuse in pregnancy.[7,8] The T-ACE (acronym for Tolerance, Annoyed when others express concern, Cut down on drinking, Eye-opener)[9] is the most frequently used screener developed and validated specifically for use during pregnancy. This screening tool has been well supported in the literature as a brief measure to identify substance use in women of childbearing age, as well as perinatal alcohol and

The authors indicate no conflicts of interest.
Dr Karjane presented this work, in part, as an oral presentation at the North American Society for Pediatric and Adolescent Gynecology 31st Annual Clinical Research Meeting, Engaging the Stars of NASPAG, April 20-22, 2017 in Chicago, Illinois.
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1083-3188/$ - see front matter
https://doi.org/10.1016/j.jpag.2018.12.003

drug use.[10] Validation studies have been conducted in diverse samples including predominantly African American women attending an inner city antenatal clinic and ethnically diverse obstetric populations. Identification of prenatal use of other drugs often relies on screeners validated in nonpregnant samples and then applied for use in this unique population, with the assumption that they can be used as designed without tailoring to the target population.[11]

Another patient group for whom tailored screening measures have been developed is adolescents, a population likely to benefit from early identification, prevention, and intervention efforts.[12] Recent epidemiological data showed more than one-third (34%) of pregnant adolescents reported having used one or more substances, suggesting a significant need to extend screening practices to such women.[13] Additionally, research suggests providers underestimate the severity of substance-related pathology in adolescents and young women, further supporting the need for routine screening in this population.[14]

Historically, most research on screening tools for problem/risky alcohol and other drug use has focused on either general population adult samples, with male and female comparisons, or specialty groups like pregnant women or adolescents. In the present study we compared younger (18-24 years) and older (25 years and older) pregnant and nonpregnant women using standardized screening tools for identification of at-risk alcohol and other drug use. Study findings will inform future screening and intervention efforts for these important female subgroups.

Materials and Methods

Participants

Participants were 3317 women attending an urban university women's health clinic who were screened for eligibility to participate in a randomized clinical trial (RCT) for an HIV intervention in pregnant women. Women 18 years of age or older were eligible; only those unable to provide informed consent because of cognitive impairment, psychiatric instability, or language barriers were excluded from study participation.

Design and Procedures

The present study used anonymous survey data collected to determine eligibility for an RCT focused on HIV/sexually transmitted disease risk reduction. All pregnant and nonpregnant women receiving care at an urban outpatient clinic during the RCT recruitment period were invited to complete an anonymous survey before their medical visit. The 5- to 10-minute survey focused on patient demographic characteristics, as well as tobacco, alcohol, and other drug use. Embedded in the anonymous survey were validated screening tools for at-risk alcohol and other drug use, as outlined in the Measures section. These screener items were used to identify women at risk for problem substance use, who were then invited to participate in the RCT on HIV/sexually transmitted disease risk reduction. Participants did not know what the RCT was about at the time they agreed to complete the anonymous survey, facilitating the recruitment of a representative sample of women who presented to the clinic for care. All research procedures were approved by the University's institutional review board. In the present study we analyzed data from the 3317 pregnant and nonpregnant women who completed the survey.

Measures

Demographic Variables

Demographic variables were age, race, and pregnancy status.

Alcohol Use and Problems

Alcohol use and problems was assessed with the 4-item T-ACE.[9] The T-ACE is a 4-item mnemonic that screens for: Tolerance (How many drinks does it take to make you feel high?); Annoyance (Have people annoyed you by criticizing your drinking?); Cut down (Have you felt you ought to cut down on your drinking?) and Eye-opener (Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover?). Scores range from 0 to 5 and a cutoff score of 2 or more was used to define risky drinking.

Illicit Drug Use

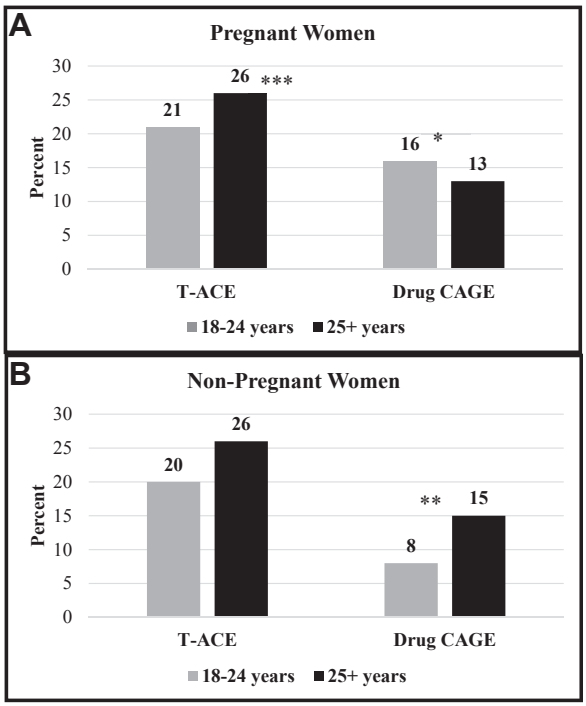
Illicit drug use was assessed with the 4-item Drug CAGE.[15] The Drug CAGE is also a mnemonic for the following items: (1) Have you ever felt you should Cut down on your use of other drugs?; (2) Have people Annoyed you by criticizing your use of other drugs?; (3) Have you ever felt bad or Guilty about your use of other drugs?; and (4) Have you ever used drugs first thing in the morning to steady your nerves, avoid withdrawal or get rid of a hangover (Eye opener)? Scores range from 0 to 4 and a cutoff score of 1 or more was used to define “at risk for problem drug use.”

Statistical Analyses

Separately for pregnant and nonpregnant women, the sample was divided into younger and older women according to the World Health Organization guidelines that define young people as ranging from 10 to 24 years of age.[16] Younger (ages 18-24 years) and older (25 years or older) women were compared on rates of at-risk drinking and

Table 1
Demographic Characteristics of the Sample

Pregnant Women (n = 2664)	Age 18-24 years (n = 1203)	Age 25 years and Older (n = 1461)
Mean age (SD)	21.12 (1.88)	30.39 (4.28)
Race		
Black	80.0% (962/1203)	53.4% (779/1461)
White	14.0% (169/1203)	39.1% (571/1461)
Other	6.0% (72/1203)	7.5% (109/1461)
Nonpregnant women (n = 653)	**Age 18-24 years (n = 332)**	**Age 25 years and older (n = 321)**
Mean age (SD)	21.17 (1.84)	30.07 (4.56)
Race		
Black	86.1% (286/332)	72.0% (231/321)
White	9.0% (30/332)	22.1% (71/321)
Other	4.8% (16/332)	5.9% (19/321)



*p<0.05, **p<0.01, ***p<0.001

Fig. 1. At-risk alcohol and drug use in adolescent and adult women. (A) Pregnant women; (B) nonpregnant women (*P < .05, **P < .01, ***P < .001).

other drug problems using χ^2 analyses. Individual screening items, as well as the number screening positive were compared across the 2 groups using a significance level of less than .05. All analyses were conducted using SPSS software, version 24 (IBM Corp).

Results

Of the 5025 women invited to participate in the anonymous survey, 3317 provided informed consent (66%) and completed the screener. As shown in Table 1, 80.3% of the sample was pregnant, with nearly half (46%) classified as younger (18-24 years) and 54% classified as older (25 years of age or older) women. Younger and older women differed in race, with younger pregnant women more likely to self-identify as black and older pregnant women more likely to identify themselves as white (χ^2 [2, n = 2662] = 222.62; P < .001). This same pattern was shown among nonpregnant women (χ^2 [2, n = 653] = 22.57; P < .001).

Prevalence of At-Risk Alcohol and Drug Use

Pregnant Sample (n = 2664)

For alcohol, older women were more likely to screen at-risk compared with younger women (26% and 21%, respectively, χ^2 [1, n = 2663] = 11.61; P = .001; Fig. 1A). For other drugs, younger women were more likely to screen at-risk for other drug problems than older women (16% and 13%, respectively; χ^2 [1, n = 2664] = 5.65; P = .02).

Nonpregnant Sample (n = 653)

The 2 groups did not differ in their risk for alcohol use (Fig. 1B). However, older women were also more likely to screen at risk for other drug problems than younger women (15% and 8%, respectively; χ^2 [1, n = 653] = 6.75; P < .01).

Individual Item Comparisons

Individual alcohol screening item responses are summarized in Table 2. The Tolerance item was the most frequently endorsed, with older pregnant women more likely to screen positive on this item compared with younger women (χ^2 [1, n = 2663] = 13.54; P < .001). The Annoyed, Eye opener, and Cut down items were endorsed less frequently with no differences according to age group for pregnant women. For nonpregnant women, however, older women were more likely to endorse all 3 items compared with younger women (Annoyed, χ^2 [1, n = 653] = 4.31; P = .04; Eye opener, χ^2 [1, n = 653] = 8.66; P < .01; Cut down, χ^2 [1, n = 653] = 8.15; P < .01).

Individual Drug CAGE screening item endorsement rates in younger and older pregnant and nonpregnant women are summarized in Table 3. Among pregnant women, rates of item endorsement were similar in younger and older women. In contrast, rates of item endorsement in nonpregnant women differed according to age on all 4 items, with older women more likely than younger women to report: needing to Cut down on drug use (χ^2 [1, n = 653] = 5.77; P = .02); people Annoyed by their use (χ^2 [1, n = 653] = 9.23; P < .01); feeling Guilty about drug use (χ^2 [1, n = 653] = 7.45; P < .01), and needing an Eye-opener (χ^2 [1, n = 653] = 12.98; P < .001).

Table 2
Alcohol Screening Items (T-ACE)

Pregnant Women (n = 2664)	Age 18-24 years (n = 1203)	Age 25 years and Older (n = 1461)	P
Tolerance (drinks to feel high)	19.3% (232/1203)	25.3% (369/1461)	<.001***
Annoyed	2.8% (34/1203)	3.8% (56/1461)	.15
Cut down*	12.3% (148/1203)	11.9% (174/1461)	.76
Eye opener*	4.3% (52/1203)	4.6% (67/1461)	.74
Nonpregnant women (n = 653)	**Age 18-24 years (n = 332)**	**Age 25 years and older (n = 321)**	
Tolerance (drinks to feel high)	19.0% (63/332)	23.1% (74/321)	.19
Annoyed	1.8% (6/332)	4.7% (15/321)	.04*
Cut down	6.9% (23/332)	13.7% (44/321)	<.01**
Eye opener	2.1% (7/332)	6.9% (22/321)	<.01**

T-ACE, tolerance, annoyed when others express concern, cut down on drinking, eye-opener.
*P < .05; **P < .01; ***P < .001.

Table 3
Drug CAGE Individual Screening Items

Pregnant Women (n = 2664)	Age 18-24 years (n = 1203)	Age 25 years and Older (n = 1461)	*P*
Cut down	11.7% (141/1203)	9.5% (139/1461)	.07
Annoyed	4.9% (59/1203)	5.3% (77/1461)	.67
Guilty	7.3% (88/1203)	8.6% (126/1461)	.22
Eye opener	8.6% (104/1203)	8.6% (126/1461)	.99
Nonpregnant women (n = 653)	**Age 18-24 years (n = 332)**	**Age 25 years and older (n = 321)**	
Cut down	5.7% (19/332)	10.9% (35/321)	.02*
Annoyed	1.8% (6/332)	6.5% (21/321)	<.01†
Guilty	5.1% (17/332)	10.9% (35/321)	<.01†
Eye opener	3.6% (12/332)	10.9% (35/321)	<.001‡

The Drug CAGE is a mnemonic for the following items: (1) Have you ever felt you should cut down on your use of other drugs? (2) Have people annoyed you by criticizing your use of other drugs? (3) Have you ever felt bad or guilty about your use of other drugs? and (4) Have you ever used drugs first thing in the morning to steady your nerves, avoid withdrawal, or get rid of a hangover (eye opener)?

* $P < .05$.

† $P < .01$.

‡ $P < .001$.

Discussion

The present study is among the first to compare younger and older pregnant and nonpregnant women using standardized screening tools for at-risk alcohol and other drug use. For pregnant women, older women were more likely than younger women to screen at-risk for problem drinking (26% and 21%, respectively). However, for other drugs, younger pregnant women were more likely to screen at-risk compared with older women (16% and 13%, respectively). Among nonpregnant women, the 2 groups did not differ in their risk for alcohol use; however, older women were more likely to screen at-risk for other drug problems than younger women (15% and 8%, respectively). The present study findings are similar to those reported by Gupman et al in an urban gynecology clinic sample of nonpregnant women, with 24% screening T-ACE positive and 8% screening Drug CAGE positive.[17]

For alcohol, the Tolerance item contributed most to group differences. This finding could be a reflection of this item being interpreted as asking about lifetime use because tolerance to alcohol develops over time, potentially progressing toward alcohol problems. Further, the tolerance item does not ask about tolerance directly, but instead about the number of drinks it takes to feel alcohol's effects, which might be less stigmatizing to answer. This was done intentionally when developing the T-ACE to reduce the stigma associated with directly disclosing substance use during pregnancy.[10] Tolerance is often not associated with problem use and the present findings support that this information might be easier to disclose than more direct questions regarding substance use.

For other drugs, older nonpregnant women were 2-3 times more likely to screen positive on all 4 CAGE items compared with younger nonpregnant women. This pattern was not seen among pregnant participants, however, because younger pregnant women were more likely to screen positive compared with older women. Although epidemiological data to date focus more on substance use prevalence rates than positive screens for associated problems, this pattern of findings is consistent with recent reports of substance use being more prevalent in pregnant compared with nonpregnant female adolescents.[14] These findings extend previous research showing a comorbidity of health risk behaviors among young adults, particularly the relationship between substance use, sexual risk behaviors, and early pregnancy.[14]

Despite the research supporting this pattern of findings, the high number of positive screens among pregnant young women was somewhat surprising, because research has shown under-reporting of substance use during the perinatal period to be common.[6] Fear of legal consequences and the stigma associated with substance use during pregnancy are typical barriers to self-disclosure and help-seeking from their health care providers.[18,19] It is for this reason that quantity and frequency of recent use (during pregnancy) data are often not collected, with the T-ACE items generally not specifying a time frame or asking about lifetime (ever) experiences. Similarly, 3 of the 4 Drug CAGE items ask about lifetime (ever) problem symptoms that avoid direct links to use while pregnant. Framing the items in this manner might be less stigmatizing and lead to greater self-disclosure among patients.

This study has several limitations. First, our younger sample of women is limited to ages 18-24 years. Women younger than 18 years of age were not enrolled in the study because of institutional review board constraints requiring parental consent for research in minors that would have interfered with being able to keep the survey anonymous. Our sample was also limited in that our pregnant and nonpregnant groups differed in their sample sizes (n = 2664 and n = 653, respectively). Thus, although we did not see a statistical difference on positive T-ACE screens among nonpregnant women, this was likely a result of power and warrants future research. Second, although we used validated screeners in the present study, these tools are still limited in that they explicitly ask about substance use, resulting in vulnerability to patients not feeling comfortable to provide accurate reports.[5] Lastly, although the T-ACE was developed specifically for use in pregnant women, the Drug CAGE was not developed for use in this population.[10]

Although in the present study we used screeners with known validity for pregnant women, future research should extend this work by using screeners validated in adolescents and young adults, as well as examine screening

practices in the postnatal period. Screening measures validated in adolescents include the Alcohol Use Disorders Identification Test[20] and the Problem Oriented Screening Instrument for Teenagers[21]; however, the CRAFFT (mnemonic for Car, Relax, Alone, Forget, Friends, Trouble)[22] is among the most popular because of its ability to screen for alcohol and other drug use in a brief 6-item measure. Although the CRAFFT has shown good psychometric properties in male and female adolescents,[13,23] little is known about applicability for pregnant teens. Further, future research on the use of screening measures in the postnatal period is warranted, because this is a time of high stress and increased risk for relapse.[24]

In summary, the results of our study suggest a strong need to screen for alcohol and substance use problems in women of all ages, regardless of pregnancy status. More than 20% of women, pregnant and nonpregnant, screened positive for at-risk drinking, with older pregnant women more likely to screen positive compared with younger pregnant women. Further, in pregnant women, younger women were more likely to screen positive for at-risk drug use compared with older women, supporting the relationship between substance use, sexual risk behaviors, and early pregnancy. Because of the significant screen-positive rates in pregnant and nonpregnant young women, the present study supports screening within this population and highlights the need for further research to develop validated measures across the spectrum of women of childbearing age.

Acknowledgments

This work was supported by the National Institute on Minority Health and Health Disparities, United States (NCMHD P60 002256).

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